

REV. A

DATE March 25, 1988
(Revised May 31, 1988)

FMEA #: 60-S70-0790-02-MD5, MD6, MD101,
MD102, MD103, MD179, MD180-02

END ITEM EFFECTIVITY:

X	X	X
OV102	OV103	CV104

MODEL NO: S70-0790-02

SUBSYSTEM: ECSS

PART NUMBER: PART NAME: REFERENCE DESIGNATION:

MC276-0035 Quick Disconnect MD5, MD6, MD101,
Non-latching MD102, MD103, MD179,
(LEAR SIEGLER) MD180

CRITICALITY NUMBER: 2

FUNCTION: Provide ground-to-orbiter Freon 114 system separation interface.

CRITICAL FAILURE MODE: Fail open/leak after separation

CAUSE: Corrosion of internal components, Mechanical failure

FAILURE EFFECT ON:

- (A) END ITEM: Discharge of Freon from hose assembly at 50 psi would contaminate GSE lines and drain freon reservoir.
- (B) INTERFACING SUBSYSTEM(S): Interconnected GSE coolant operations would be exposed to contamination and possible loss of coolant freon.
- (C) ORBITER: Possible exposure of orbiter to Freon 114 discharge.
- (D) PERSONNEL: Possible exposure of personnel to freon discharge.

HAZARDS: Possible exposure of personnel to freon discharge.
Possible damage to flight hardware.
Possible contamination of flight hardware.

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ACCEPTANCE RATIONALE

DESIGN: Review of assembly documents and Specification Material Document (SMD) MC276-0035 has provided design data points to be complied with for acceptance rationale.

Design data points:

Operational envelope is to exceed the expected use envelope of 0 to 265 psig at 10,000 lbs/hr flow of freon 114. Manual engagement and closure of disconnects with assurances of positive locking feature. Internal pressure design point of 0 to 265 psig & 10,000 lbs/hr flow for the operational life of 10 years or 1000 cycles. Structural safety factor of better than 2:1 above design loads.

TEST:

PRE-OPERATIONAL: Per OMI V3537 Pressure test to system operating pressures with GHe, 110 ± 5 psig, are conducted prior to Freon 114 recirculation servicing. Physical inspection of interface.

INSPECTION:

PRE-INSTALLATION: Per MC276-0035 (5.1 - 5.1.5)
Acceptance Test: Examination of product, The AHC, the AHC cap the GHe, and the GHe cap shall each be carefully examined to determine conformance to the requirements of this specification. Particular attention shall be given to weight, workmanship, finish, dimensions, construction, identification, marking, traceability level, and to the use of certified materials and processes.

AGE LIFE: Per OMI S6013, the assembly is inspected annually for compliance to the material and assembly specifications.

PRE-OPERATIONAL: Per OMI V3537 Components are inspected for cleanliness per MAO110-311, level 300 by visual inspection of bagging and sealing of interface ports and/or research of applicable TAIR books prior to each use.

OPERATION:

Manual attachment and monitored filling insure a secure connection by personnel.

DETECTION: Visual detection of freon 21 discharge.

CORRECTION: Isolation and replacement.

FAILURE HISTORY:

Review of PRACA Data Base has provided no structural fatigue failure history on item MC276-0035.

Freon Circulation Set, S70-0790-2:

This assembly is provided to facilitate freon 114 circulation through the Orbiter T-O Umbilical Carrier Plate, left side aft fuselage (Figure 3.2). The set consists of in-line 25 micron filters on the inbound lines, self latching disconnects with automatic shut off, flex hoses for fluid routing and a GSE freon jumper for servicing and freon 114 internal routing.

The QD/Filter set is the last stage of GSE in the ECLSS OFF and MLP operations and is responsible for the interface between ground circulation and the vehicle. During pad separation operations, the quick disconnects are pressurized to 50 psig and experience 10 g's during retraction of the T-O umbilical carrier plate into the tail service mast. Detailed assembly drawing of the QD assemblies are seen in Figures 3.2. Individual component identification is given in table 3.2.

TABLE 3.2

ITEM . .	FUNCTION	LOCATION
1	Primary freon supply	Primary T-O Umbilical
2	Primary freon return	"
3	Freon servicing jumper	Umbilical GSE L/H

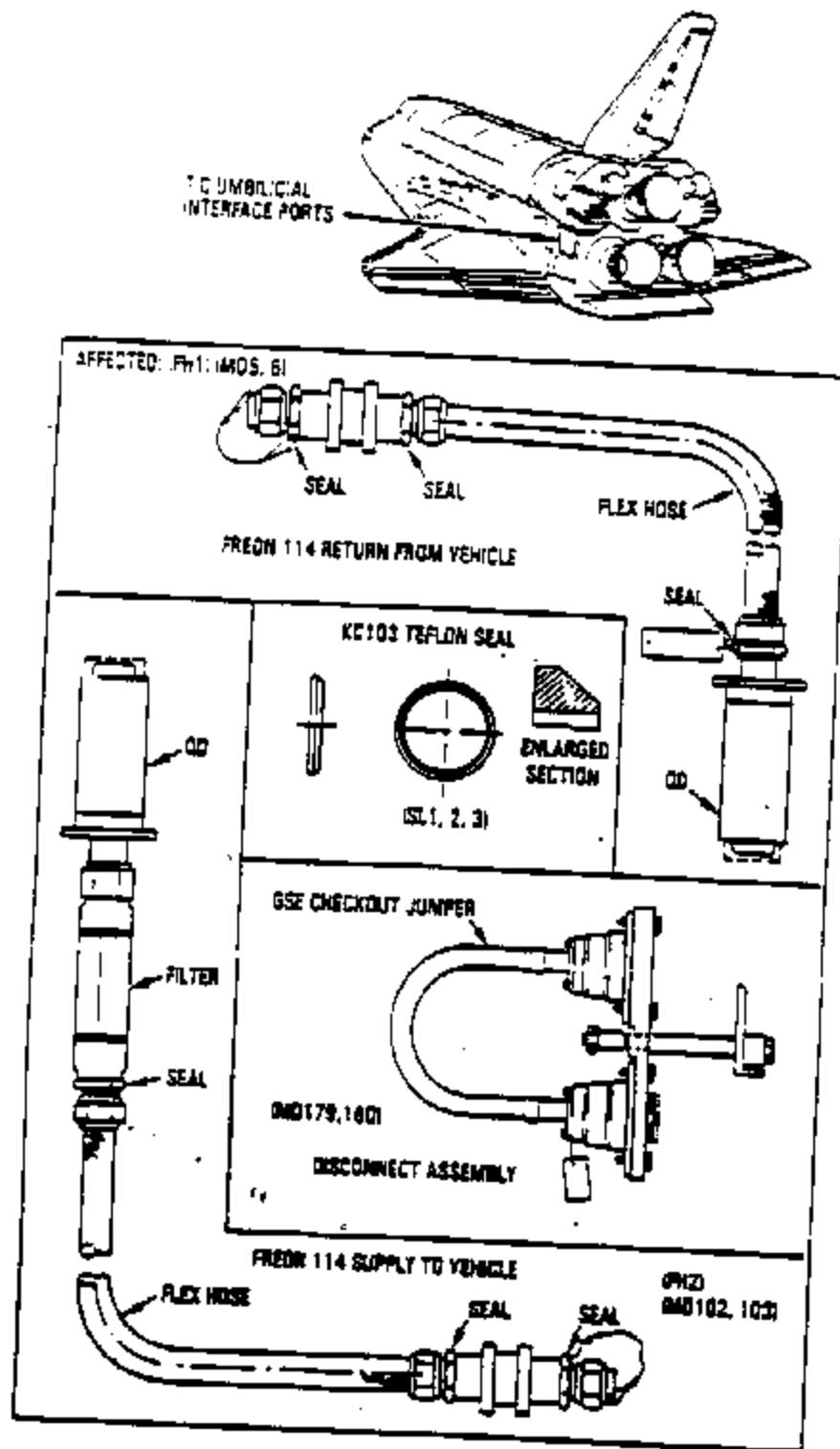


Figure 3.2. Freon Circulation Set (S70-0790-02)

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END ITEM: 570-0790-02, FREON 114 CIRCULATION SET

PART NUMBER/ REF. DESIGNATOR	PART NAME	QTY. (PER SYSTEM)	HDW. CRIT.
4000016-0500 FH1	Flex Hose	1	2
R50200CG162-0190 FH2	Flex Hose	1	2
ME286-0078 FL5,6	In-line Filter	2	2
MC276-0035 MD5,6,101 MD102,103 MD179,180	Mechanical Disconnect	6	2

The OMRSO, File VI, is in development and at the completion of this FMEA/CIL each critical item will be reviewed against it. If necessary, the OMRSO will be revised to cover all applicable requirements for each critical item.

TABLE 8-2
CRITICAL ITEMS LIST